Short or probationary forms of inauguration ceremonies are found in several districts, and a knowledge of them is highly valuable, as exhibiting the various stages through which a youth must pass before he is qualified to take his place as a full man of his tribe. In a different portion of the same tract of country, there is another elementary ceremony known as the *Dhalgai*, described by me elsewhere.[1] Both the *Nguttan* and the *Dhalgai* are practiced in parts of the geographical area represented as No. 5 on the map of New South Wales hereto appended (Plate V).

PRELIMINARY NOTE ON THE SELENODONT ARTIODACTYLS OF THE UINTA FORMATION.

BY W. B. SCOTT.

(*Read March 18, 1898.*)

In 1895, Mr. J. B. Hatcher collected for the Princeton Museum some unusually well-preserved specimens of Selenodont Artiodactyls in the Uinta beds of northern Utah. In preparing a monograph upon these forms I have found certain new and undescribed genera which have proved to be of remarkable phylogenetic interest, and the much more complete material now available of genera previously named gives us most welcome information. As the detailed account of these fossils cannot appear for many months, it is desirable to publish a brief notice of the new forms and of the principal conclusions to which the study of the Uinta Selenodonts has led. One of the most marked changes between the mammalian life of the Bridger and that of the Uinta is in the great increase of the Artiodactyls in general and of the Selenodonts in particular. In the Bridger beds only two genera at most of the latter group have been described, and remains of even these are very rare; in the Uinta, on the other hand, Artiodactyls are the most abundant fossils and not less than eight genera of Selenodonts may be determined, while others are indicated by specimens not sufficiently well preserved for description.

The most interesting and striking result to which the study of the

[1] "The Dhalgai Ceremony," *Journ. Anthrop. Inst.*, Vol. xxvi, pp. 338–340.

Uinta Selenodonts has led is the very unexpected conclusion that, *with the possible exception of the Oreodonts and Agriochœrids, all of the strictly indigenous North American Selenodonts are derivatives of the Tylopodan stem.* The true Ruminants (Pecora) are an Old World type and did not reach this continent till late Miocene times, but the Tylopoda underwent an expansion and differentiation in America comparable to that of the Pecora in Europe, of which they took the place here. This conclusion was long ago suggested, with wonderful insight, by Rütimeyer, but as he did not discuss the question and brought forward no evidence in support of his views, the suggestion never attracted the attention which it so well deserved. The White River forms, *Leptomeryx*, *Hypertragulus*, *Hypisodus* and *Protoceras*, have long baffled the investigator who attempted to determine their true systematic position, but it has now become exceedingly probable that they are all variants of the Tylopodan type, the main line of which is represented in White River times by the genus *Poebrotherium*, whose position has long been recognized as ancestral to the modern camels and llamas. It should be added, however, that this somewhat surprising result has been much strengthened and confirmed by far more complete material of *Leptomeryx* and *Hypertraguus* than had previously been known. This new material, which was gathered at various times by Messrs. Hatcher and Gidley, makes the Tylopodan affinities of these White River genera much more conspicuous than any one had imagined. In the extended paper which is now in course of preparation these newly obtained specimens will be described and figured in comparison with their forerunners of the Uinta.

Parameryx Marsh.

Amer. Jour. Sci., third series, Vol. xiv, p. 364 (*nomen nudum*).
Ibid., Vol. xlviii, p. 269.

In this genus the dentition is complete, I. $\frac{3}{3}$, C. $\frac{1}{1}$, P. $\frac{4}{4}$, M. $\frac{3}{3}$ and there are no diastemata. The incisors and canines are small, the premolars simple and trenchant and the molars very brachyodont and composed of four crescents. The skull is exceedingly like that of *Poebrotherium*, but has a shorter muzzle, a less capacious cranium, a more widely open orbit and a very much smaller tympanic bulla, which is not filled with cancellous tissue. The ulna and radius are separate, at least in young individuals; the manus consists of four

functional digits, though the lateral metacarpals are already very much more slender than the median pair. The fibula is complete and not coössified with the tibia at any point, but its shaft is so reduced as to be a mere thread of bone. The pes contains two functional metatarsals, iii and iv, while Nos. ii and v are long, filiform and splint-like rudiments to which, apparently, no phalanges are attached, but this is still doubtful. The phalanges of the functional digits resemble those of *Poebrotherium*, and the unguals have the same long, pointed and slender, antelope-like shape.

There can be very little doubt that *Parameryx* is the direct and immediate ancestor of the White River *Poebrotherium*, which it so much resembles, and thus it holds an important place in the main line of Tylopodan descent.

Leptotragulus Scott and Osborn.

Proc. Amer. Phil. Soc., 1887, p. 258.

In a former account of this genus,[1] the type of which is a fragment of the mandible containing p $\frac{}{3}$, $\frac{}{4}$ and m $\frac{}{1}$, I made the mistake of referring to it certain limb and foot bones which, it is now apparent, belong to the very distinct genus *Parameryx*, from which *Leptotragulus* differs in the form of the premolars and in the presence of diastemata. At present I am not able to refer to the latter genus any of the newly acquired material, and hence can add nothing to my original account[2] of it. It differs but comparatively little, however, from the following genus, the structure of which may be very fully described.

Merycodesmus, gen. nov.

Dentition unreduced; I. $\frac{3}{3}$, C. $\frac{1}{1}$, P. $\frac{4}{4}$, M. $\frac{3}{3}$; upper incisors conical, pointed and slightly recurved; upper canine large, compressed and thick; lower canine incisiform; p $\frac{1}{}$ near canine, with diastema behind it; p $\frac{2}{}$ with deuterocone; p $\frac{}{1}$ caniniform and opposing upper canine; p $\frac{}{4}$ with large deuteroconid. Molars composed of four crescentic lobes, m $\frac{}{3}$ with fifth lobe. Forehead elongate and lozenge-shaped, sagittal crest short, as in *Parameryx;* mandible with very extended angle. Manus and pes having four

[1] Trans. Amer. Phil. Soc., Vol. XVI, p. 479.

[2] Proc. Amer. Phil. Soc., 1887, p. 258.

functional digits; lateral metapodials less reduced than in *Parameryx*.

Merycodesmus gracilis, sp. nov.

Size small; orbit small and bounded behind by very long decurved postorbital process of frontal; cranium relatively broad and capacious; mandible very slender.

Measurements.

Upper dentition, length I 1 to M 3	0.071
" premolar-molar series, length	.054
" molar series, length	.022
" canine, ant.-post, diameter	.006
" canine, transverse diameter	.003
" M 1, length	.006
" M 1, width	.0085
" M 2, length	.008
" M 2, width	.010
" M 3, length	.009
" M 3, width	.011
Lower dentition, length I 1 to M 3	.072
" premolar-molar series, length	.058
" premolar series, length	.032
" molar series, length	.026
" P 1, length	.0045
" P 2, length	.0055
" P 3, length	.007
" P 4, length	.0065
" M 1, length	.0065
" M 2, length	.0075
" M 3, length	.011

(N. B.—The apparently great length of the premolar series is due to the diastema behind p1)

The dentition of *Merycodesmus* is quite similar to that of *Parameryx*, but differs in certain very significant ways. Thus, the lower incisors have more chisel-shaped crowns, and the lower canine has become one of them in form and function; the upper canine is much larger and the first lower premolar has taken on the form and function of the canine. In each jaw a long diastema separates p 1

from p 2. The other premolars and the molars are much alike in the two genera save that the latter are relatively broader in *Merycodesmus*. This genus differ from *Leptotragulus* in the greater complexity of the inferior premolars, and especially in the large development of the deuteroconid on $p_{\overline{4}}$. From *Oromeryx* it may be distinguished by the diastemata and by the more symmetrically quadrate shape of the upper molars.

The skull bears a close resemblance to that of *Parameryx*, but has a somewhat more elongate muzzle and longer postorbital processes of the frontals; the forehead has the same elongate lozenge-like shape, the temporal ridges converging gradually behind into the short sagittal crest; the mandible has an elongate, slender horizontal ramus, which is somewhat stouter than that of *Parameryx;* whether the very broad ascending ramus possessed a similar hook-like angle to that of the latter genus cannot at present be precisely determined; the coronoid process is even more recurved and pointed. The posterior nares are far back, their front border being opposite $m^{\overline{3}}$, and a deep palatal notch intervenes between the hinder half of $m^{\overline{3}}$ and the external wall of the narial canal.

The axis has a conical odontoid process.

The fore foot has four digits, of which the lateral metacarpals are reduced and slender, though distinctly less so than in *Parameryx*. The tarsus is lower than in the latter genus, and the lateral metatarsals are functional, not mere filiform splints. The phalanges are essentially alike in the two genera.

The entire structure of *Merycodesmus* strongly suggests that it was the forerunner of the White River genus, *Leptomeryx*, and, through a somewhat different line, of *Protoceras* also. In *Leptomeryx* the upper canines have been lost, the lower canine resembles an incisor, but $p_{\overline{1}}$ is just like a minute canine and one can hardly escape the inference that it formerly functioned as a canine and has dwindled because of the loss of the upper canine, which it opposed. *Protoceras* still retains, in the male sex, the large upper canine, which is opposed by $p._{\overline{1}}$ and thus abraded upon the posterior surface, but in the females the upper canine is vestigial.

Camelomeryx, gen. nov.

$I.^{\overline{2}}$, $C.^{\overline{1}}$, $P.^{\overline{4}}$, $M.^{\overline{3}}$. Upper incisors small, canines stout, but short; a long diastema between $p^{\overline{1}}$ and $p^{\overline{2}}$. Premolars and molars closely

resembling those of the preceding genus, but molars with larger external buttresses. Forehead broad and short, sagittal crest long; temporal ridges confined to frontals. Posterior nares farther back than in *Merycodesmus* and palatal notches absent.

In this genus the superior dentition is, except in the character of the incisors, very similar to that of *Merycodesmus*, but the shape of the forehead, the cranium and the hinder part of the palate are very different. In the absence of the lower jaw, it is not practicable to determine finally whether this form is congeneric with *Leptotragulus*, but the character of the upper premolars leads me to believe that it will prove to be quite distinct.

Camelomeryx longiceps, sp. nov.

Size, small; cranium long and slender; orbits small and widely open behind; postorbital processes of frontals extended transversely, but little decurved.

Measurements.

Upper dentition, length I 1 to M 3	0.062
" canine, ant.-post. diameter	.005
" canine, transverse diameter	.003
" premolar-molar series, length	.051
" premolar series, length	.029
" molar series, length	.021
" M 1, length	.0055
" M 1, width	.0075
" M 2, length	.007
" M 2, width	.010
" M 3, length	.0085
" M 3, width	.0115

That *Camelomeryx* and *Merycodesmus* are nearly allied genera will be at once apparent from the foregoing description. Whether the former is the ancestor of some White River genus, such as *Hypertragulus*, or whether it is a mere variant of *Merycodesmus* and without permanent phylogenetic significance, must await the decision of more complete material.

OROMERYX Marsh.

Oromeryx Marsh, *Amer. Journ. Sci.*, third series, Vol. xiv, p. 364 (*nomen nudum*).

Oromeryx Marsh, *Amer. Journ. Sci.*, third series, Vol. xlviii, p. 269.

No representative of this genus has yet been detected in the Princeton collection; it may be distinguished from the preceding genera by two principal characters. According to Marsh, "there is no diastema in the dentition," and in the second place, his figure shows that the upper molars, especially m $\frac{3}{}$, have a subovate crown, due to the much greater transverse breadth in the anterior than in the posterior half.

PROTOREODON Scott and Osborn.

Agriochœrus Marsh (non Leidy), *Amer. Journ. Sci.*, third series, Vol. ix, p. 250.

Eomeryx Marsh, *ibid.*, Vol. xiv, p. 364 (*nomen nudum*).

Protoreodon Scott and Osborn, PROC. AMER. PHIL. SOC., 1887, p. 257.

Eomeryx Marsh, *Amer. Journ. Sci.*, third series, Vol. xlviii, p. 266.

The collection contains a large number of specimens appertaining to this genus, and adds very materially to our knowledge of it, but as the newly acquired individuals only confirm the conclusion previously reached, that this genus is ancestral to the *Oreodontidæ* of the Oligocene and Miocene, description of the new material will be reserved for the extended paper.

AGRIOTHERIUM gen. nov.

Premaxillaries reduced and upper incisors small; upper canine large, recurved and trihedral; premolars simple and thick transversely; p $\frac{}{1}$ caniniform; p $\frac{3}{}$ implanted by three fangs, but has no deuterocone; deuterocone of p $\frac{4}{}$ conical, not crescentic; molars like those of *Protoreodon*, but with outer crescents of superior molars more concave, and more prominent median buttress, into which median valley extends. Cranium relatively longer and face shorter than in *Protoreodon* and postorbital processes of frontals shorter.

This genus is evidently very close to *Protoreodon*, but may be distinguished from it by the reduced premaxillaries, the smaller incisors, the simpler premolars and the more concave outer lobes of the upper molars, as well as by the longer cranium, shorter face, and less prominent postorbital processes.

Agriotherium paradoxicum, sp. nov.

Skull about equal to that of *Oreodon gracilis* in length, but much more depressed; mandible stout and chin steeply inclined.

Measurements.

Skull, length on basal line	0.131
" width across zygomata	.077
Length occ. crest to ant. border of orbit	.085
" ant. border orbit to prmx	.051
Mandible, height of condyle	.048
" depth at m.$\frac{2}{2}$	.025
Upper premolar-molar series, length	.0525
" premolar series, length	.029
" molar series, length	.024
" canine, ant.-post. diameter	.006
" canine, transverse diameter	.006
" P 1, length	.0075
" P 2, length	.0065
" P 3, length	.007
" P 3, width	.006
" P 4, length	.006
" P 4, width	.0085
" M 1, length	.075
" M 1, width	.009
" M 2, length	.008
" M 2, width	.011
" M 3, length	.009
" M 3, width	.012
Lower P 3, length	.007
" P 3, width	.003
" P 4, length	.0075
" P 4, width	.004
" molar series, length	.027
" M 1, length	.007
" M 1, width	.0055
" M 2, length	.008
" M 2, width	.006
" M 3, length	.012
" M 3, width	.007

The differences between *Protoreodon* and *Agriotherium* are such as strongly to suggest the inference that, while the former is the ancestor of the Oreodonts, the latter stands in a similar relation to the Agriochœrids. This determination can, at present, be only provisional, until more is learned concerning the foot-structure of the present genus. At all events, if *Agriotherium* be not the desired ancestral form, we may feel confident that that form, when found, will prove to be of a very similar character.

HYOMERYX Marsh.

Amer. Journ. Sci., third series, Vol. xlviii, p. 268.

This genus, which is described as having no upper incisors, I have not seen. It differs from the two preceding genera not only in the loss of the upper incisors, but also in the form of the upper molars, which have far less concave external crescents, and less prominent outer buttresses.

The study of the Uinta Selenodonts lends much strength to the opinion expressed by various writers, that the Oreodonts are related to the Tylopoda. It now appears likely that this family leads back either to *Homacodon* of the Bridger, or to some nearly allied form of the same family. If this be true, we shall then have the more extended generalization, that all of the indigenous North American Selenodonts belonged to the Tylopoda and that this suborder has had a much more extended and varied development than we have hitherto supposed. While this conclusion is already extremely probable for the other families, we have yet to find the direct forerunners of *Protoreodon* and *Agriotherium* before it can be established for the Oreodonts and Agriochœrids.

Stated Meeting, April 1, 1898.

Mr. FREDERICK PRIME in the Chair.

Present, 12 members.

Correspondence was submitted and donations reported.

Dr. Morris, on behalf of the Curators, exhibited a *facsimile* of the Declaration of Independence in the handwriting